

A SURVEY OF THE TIGER BEETLES (COLEOPTERA: CICINDELIDAE) OF COLORADO¹

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ABSTRACT: Thirty-three species of tiger beetles representing two genera are recorded from Colorado. This richness of species is a combination of the great geomorphological diversity of Colorado, and the close proximity of Colorado to the area of highest North American tiger beetle diversity, the southwest. Taxonomic clarifications are given for several literature records.

The general distributions of North American tiger beetles are relatively well known (Boyd *et al.* 1982). However, no checklist is presently available for the Colorado species. Wickham (1902) in his catalogue of Colorado beetles provides a list of species. However, the taxonomy is out-of-date and unreliable. The richness of the cicindelid fauna of Colorado is especially interesting because of two factors: (1) the diverse geomorphology of Colorado, with elevations ranging from 1020 m at the Kansas border to numerous peaks exceeding 4000 m in the Rocky Mountains, and (2) the close proximity of Colorado to the center of the highest North American tiger beetle diversity, the southwest (Willis 1972). Colorado is readily divided into three broad physiographic regions: plains, mountains and the plateaus (Fig. 1). The eastern two-fifths of the state is the western extension of the Great Plains. The southern Rocky Mountains rise abruptly, with the eastern most range, the Front Range displaying some of the most striking high-altitude scenery in the world (Chronic and Chronic 1972). The western quarter of the state is characterized by flat-topped plateaus overlooking steep gorges cut by rivers.

Many species of tiger beetles have distinctive distribution patterns associated with these land forms in Colorado. For example, *Cicindela denverensis* Casey, *C. p. pulchra* Say, *C. s. scutellaris* Say and *C. o. obsoleta* Say are restricted to plains. *Cicindela f. formosa* Say and *C. scutellaris* Say, both common widespread eastern and central North American species reach their western limit of distribution in Colorado along the Front Range, except for isolated populations of *C. f. gibsoni* Brown and *C. s. yampae* Rumpff in Moffat County (Fig. 1). *Cicindela duodecimguttata* Dejean also reaches its western limit of distribution in Colorado, whereas *C. o. guttifera* LeConte reaches its eastern most range limit in the Front Range. North-south range limits of several species occur in Colorado. *Cicindela l. limbata* Say reaches its most southern limit and *C. o. obsoleta*

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Say, *C. o. santaclarae* Bates, *C. marutha* Dow, *C. n. nigrocoerulea* LeConte, and *C. n. bowditchi* Leng reach their northern limit in Colorado. *Cicindela theatina* Rotger, originally described from the Great Sand Dunes, Alamosa County, is only known from a small area of southern Colorado.

The following preliminary checklist follows the classification of Boyd *et al.* (1982). Generally, Willis' (1968) (adaptation of Rivalier, 1954) taxonomic treatment of the species of *Cicindela* was followed. The subfamily Cicindelinae is represented in Colorado by 2 genera and 33 species. The number of species reported herein is less than New Mexico (38) but higher than other surrounding states of Kansas (30), Wyoming (28) and Utah (24) (Boyd *et al.* (1982)). Boyd *et al.* (1982) listed *Megacephala virginica* (L.) from Colorado, but this record is considered here doubtful (R.L. Huber, personal communication), and is not included. This species was listed for Oklahoma near the Colorado border by Drew and Van Cleave (1961). Three additional subspecies records (*C. n. nigrocoerulea* LeConte, *C. o. santaclarae* Bates and *C. p. cinctipennis* LeConte), not originally listed by Boyd *et al.* (1982) from Colorado are included and clarified for the first time. The following species have been collected in surrounding states and may eventually be collected in Colorado: *C. cursitans* LeConte (Kansas and Nebraska), *C. celeripes* LeConte (Kansas, Nebraska, and Oklahoma), *C. sedecimpunctata* Klug (Arizona and New Mexico), *C. sperata* LeConte (Arizona, New Mexico, Oklahoma, and Utah), *C. tenuisignata* LeConte (Arizona, New Mexico, Oklahoma, and Utah), and *C. willistoni* LeConte (Kansas, New Mexico, Oklahoma, Utah, and Wyoming). County records (numbers) following each species refer to Fig. 1.

Tiger Beetles of Colorado

Subfamily Cicindelinae Fisher

Tribe Megacephalini W. Horn

Subtribe Omina W. Horn

Genus *Amblychelia* Say

A. cylindriciformis (Say)

This species is known only from the plains physiographic region of Colorado. Counties: 6, 15, 32, 38, 40, 59, 60, 61, 62, 63

A. picolomini Reiche

No specimens of this species were examined during this study. Vaurie (1955) listed a single specimen from Montezuma County. County 50

Tribe Cicindelini Sloane
Subtribe Cicindelina W. Horn

Genus *Cicindela* L.
Subgenus *Cicindela*(s. s.)

C. longilabris laurentii Schaupp

The geographic variation of this species was documented by Spanton (1988). Counties: 1, 3, 5, 18, 21, 26, 28, 42, 50

C. nebraskana Casey

Spanton (1988) did not cite specimens from Colorado, but recent collecting has established its presence well into Colorado. Counties: 4, 32

C. repanda repanda Dejean

This fluvial species can be usually collected wherever suitable habitats occur throughout the state. Counties: 1, 4, 5, 7, 11, 14, 16, 20, 24, 25, 30, 32, 38, 48, 50, 58, 59, 61, 62

C. duodecimguttata Dejean

This fluvial species reaches its western range limit along the Front Range. Counties: 5, 11, 41

C. oregona LeConte

It is expected that this species inhabits all of the western half of the state. The subspecies *C. o. oregona* LeConte, *C. o. guttifera* LeConte, and *C. o. navajoensis* Van Dyke were listed for Colorado by Boyd *et al.* (1982), however, *C. o. oregona* does not occur in Colorado (Freitag 1965).

C. oregona guttifera LeConte

The subspecies ranges from the Front Range to the Western Slope. Counties: 1, 5, 16, 17, 20, 22, 23, 24, 27, 29, 30, 31, 32, 33, 41, 43, 46, 47, 48, 51, 52, 53, 54, 55, 56, 59

C. o. guttifera LeConte X *C. o. navajoensis* Van Dyke

Specimens of this hybrid form (*sensu* Freitag 1965) have been collected in Mesa County, especially in Colorado National Monument. No specimens clearly assignable to *C. o. navajoensis* were examined from Colorado. Interestingly, Freitag (1965) also did not list any material of this form from Colorado, despite indicating that Colorado is included in the geographical range of this subspecies (his Fig. 18). County 24

C. hirticollis shelfordi Graves

This recently described subspecies occurs throughout Colorado except the extreme western edge (Graves *et al.* 1988). Counties: 5, 6, 9, 14, 15, 38, 61

C. hirticollis corpuscula Rumpff

Twelve specimens from Mesa County, Colorado River, south of Loma

in the University of Colorado collection are assignable to this subspecies. Rumpff (1961) did not examine any Colorado material. County 24

C. limbata limbata Say

This species reaches its southernmost limit in northeastern corner of Colorado. Counties: 9, 10, 11

C. theatina Rotger

The type locality of this species is the Great Sand Dunes National Monument, Alamosa County, and is restricted to these sand dunes and adjacent areas. Counties: 43, 55, 57

C. formosa formosa Say

This species reaches its western limit in Colorado along the Front Range, and can be expected to occupy most suitable habitats of the plains physiographic region of Colorado. Counties: 5, 6, 7, 10, 11, 14, 17, 33, 36, 37, 38, 41, 55, 61, 62

C. formosa gibsoni Brown

This is the only population of *C. formosa* west of the Front Range and only known from Moffat Co. Wallis (1961) listed the only other populations of *C. f. gibsoni* Brown from Saskatchewan, Canada. The Colorado population has been recognized as another distinct subspecies by Gaumer (1977) in an unpublished thesis. County 1

C. purpurea group

Various workers disagree on the exact taxonomic status of *C. p. audubonni* LeConte, *C. p. cimarrona* LeConte, *C. s. splendida* Hentz, *C. denverensis* Casey, *C. l. limbalis* and other forms in the *purpurea* group. Until a comprehensive revision treating all these taxa becomes available, Boyd *et al.* (1982) will be followed.

C. purpurea audubonii LeConte

The complete range of this common subspecies in Colorado is unknown. Counties: 5, 6, 9, 14, 16, 17, 20, 32, 33, 56

C. purpurea cimarrona LeConte

Counties: 16, 41, 48, 52, 59

C. splendida splendida Hentz

The plains of Colorado is the western limit of this species, and is apparently uncommon in Colorado. Counties: 6, 7

C. denverensis Casey

The type locality of this species is Denver (Denver County) (Casey 1897). Counties: 5, 6, 7, 13, 39, 60

C. limbalis limbalis Klug

Counties: 3, 5, 17, 21, 32, 61

C. decemnotata Say

This species may be restricted to the western portion of Colorado. Counties: 1, 51

***C. pulchra pulchra* Say**

This grassland species inhabits most or all of the plains physiographic region of Colorado, and is more common in southeastern Colorado. Counties: 5, 6, 14, 32, 40, 41, 52, 58, 60, 61, 62

***C. fulgida fulgida* Say**

Counties: 5, 6, 8, 9, 14, 21, 32, 39, 41, 56, 58, 60, 61, 62

***C. scutellaris scutellaris* Say**

This grassland species reaches its western limit of its range in Colorado. Counties: 6, 7, 8, 9, 10, 12, 32, 40, 41, 58, 61, 62

***C. scutellaris yampae* Rumpff**

The type locality of this apparently endemic subspecies is Moffat County (Rumpff 1986). County 1

***C. lengi* W. Horn**

The three subspecies (*C. l. lengi* W. Horn, *C. l. versuta* Casey, and *C. l. jordai* Rotger) were listed for Colorado by Boyd *et al.* (1982). However, *C. l. jordai* does not occur in Colorado (R.L. Huber, personal communication). The exact status of *C. l. lengi* and *C. l. versuta* in Colorado is unclear. Some populations appear to have both forms represented. Therefore, localities will not be separated except for *C. l. versuta*.

***C. lengi* W. Horn**

Counties: 4, 5, 6, 7, 14, 32, 33, 34, 58, 59, 61

***C. lengi versuta* Casey**

The following are literature records only (Willis and Stamatov 1971; Lawton 1972), and no specimens were examined. Counties: 1, 55

***C. tranquebarica* Herbst**

Colorado has two subspecies, the eastern *C. t. tranquebarica* Herbst and western *C. t. kirbyi* auct. These subspecies were not separated in this study because of apparent hybrids and incomplete distribution records throughout the range of these forms in Colorado. Counties: 1, 5, 6, 7, 9, 14, 17, 22, 24, 32, 36, 48, 55, 58, 62

Subgenus *Cicindelidia* Rivalier

***C. nigrocoerulea nigrocoerulea* LeConte**

This subspecies was previously reported from adjacent states of New Mexico and Kansas (Boyd *et al.* 1982), but not Colorado. However, Leng (1902) and W. Horn (1930) listed Colorado as part of this species distribution. Willis and Stamatov (1971) reported this species from Boulder County, which is apparently the most northern record of this species. Counties: 17, 32, 40, 58, 60, 62

***C. nigrocoerulea bowditchi* Leng**

The type locality of this subspecies is near Durango (La Plata County) (Leng 1902). Relatively unmarked individuals occur in populations of

this subspecies form. Counties: 50, 51, 52

***C. obsoleta obsoleta* Say**

Counties: 6, 14, 32, 39, 40, 58, 59, 61, 63

***C. obsoleta santaclarae* Bates**

Boyd *et al.* (1982) did not list this form from Colorado, however, Leng (1920) (as *C. o. anita* Dow) and W. Horn (1930) recorded specimens from Colorado. Specimens of this subspecies were only examined from counties bordering New Mexico. Counties: 51, 52

***C. punctulata punctulata* Olivier**

Probably the most common and widespread Colorado tiger beetle. Numerous large series of individuals were examined from light trap collections, especially from the plains. Counties: 1, 5, 6, 8, 11, 12, 17, 23, 24, 29, 32, 36, 37, 38, 39, 40, 41, 42, 47, 49, 50, 52, 55, 58, 59, 61, 62, 63

***C. haemorrhagica haemorrhagica* LeConte**

Boyd *et al.* (1982) listed this species for Colorado, but no specimens were examined during this study.

Subgenus *Habroscelimorpha* Dokhtourow

***C. circumpecta johnsoni* Fitch**

Counties: 60, 61, 62

Subgenus *Eunota* Rivalier

***C. togata globicollis* Casey**

Colorado is the western most range extension for the form. Counties: 29, 60, 61

Subgenus *Cylindera* Westwood

***C. pusilla pusilla* Say**

Boyd *et al.* (1982) listed this species as *C. terricola* Say. A revision of the *C. pusilla* group is needed to clarify the proper usage of these names. No specimens of *C. p. pusilla* were examined during this study.

***C. pusilla cinctipennis* LeConte**

Boyd *et al.* (1982) did not include this subspecies from Colorado. Leng (1902) listed Colorado as part of the range of this form, but in 1920 did not include it. Counties: 1, 5, 23, 24, 32, 50, 52, 54

Subgenus *Ellipsoptera* Dokhtourow

***C. nevadica knausi* Leng**

Counties: 29, 38, 58, 60, 61, 62

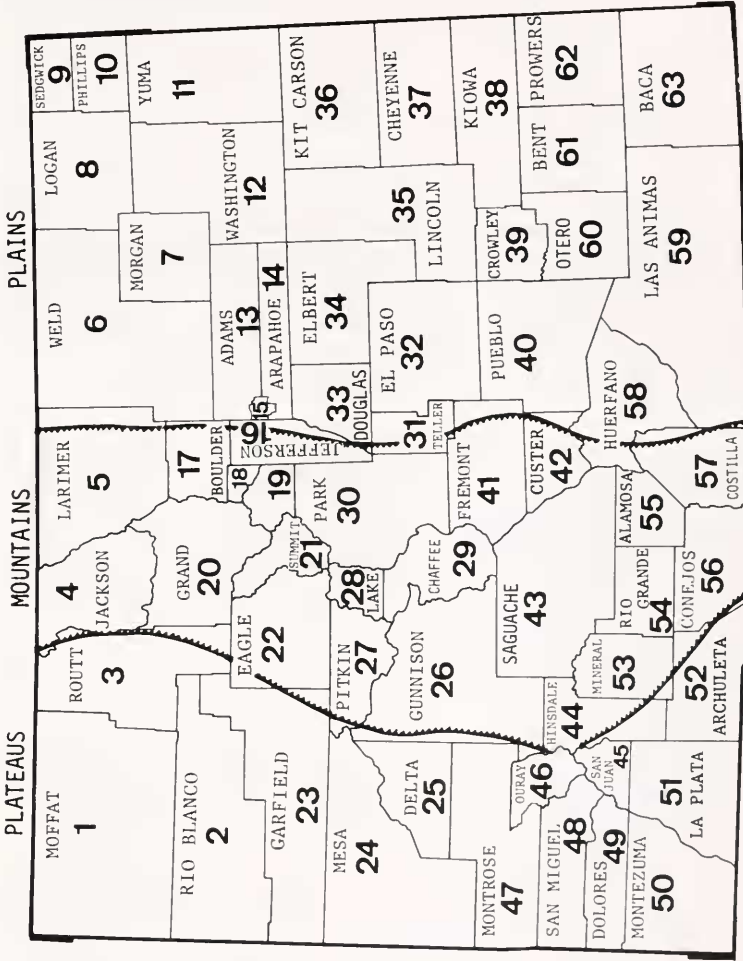


Fig. 1. Map of Colorado indicating counties and three physiographic regions.

C. cuprascens LeConte

Counties: 5, 11, 15, 38, 39, 40, 59, 60, 61, 62

C. macra macra LeConte

Willis (1967) provided records for this species. Apparently Colorado is the western limit of its range. Counties: 5, 15

C. marutha Dow

Counties: 24, 39, 61, 62

C. lepida Dejean

Counties: 6, 60, 61, 62

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